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DISCLOSURE TEXT:

1p. A method is described in which magnetic fields locally confined to the substrates are used for RF plasma deposition and RF plasma etching. - From plasma physics, it is known that magnetic fields influence RP plasma. In the cases that have become known so far, the magnetic fields influence the whole plasma, so that the characteristics of the whole plasma volume are dependent upon the magnetic field. - In accordance with the present method the magnetic fields are locally confined to the substrates during RF plasma deposition and RP plasma etching; only the charged plasma particles close to or at the substrate surface are affected; i.e., the surface processes can be controlled independently of reactions in the plasma volume. - The local influence of the magnetic fields leads to a higher deposition rate during plasma etching and to a shorter reaction period. During etching, the etch rate ratios of the various materials are influenced. - In experiments, permanent magnets or electromagnets were arranged below the substrates in such a manner that the magnetic vector acting on the substrate surface is either perpendicular or parallel to the E field of the plasma reactor. During the plasma deposition of SiN(x), using a magnetic field H perpendicular to the E field of the plasma reactor, the deposition rate could be increased by 50 percent. The diffraction index and the etch rate were the same as for a monitor wafer. During the plasma etching of SiN(x), the etch rate at the location of the magnet could be increased by 11 percent, using a magnetic parallel to the E field of the plasma reactor.

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